their lead content. In the Exhibits, there are two different basic compositions, namely, that denoted system A, and that denoted system B.

Specifically, as shown in Exhibit A, examples A-1 to A-3 represent compositions in the present invention, whereas examples A4 to A7 represent comparison compositions. All the A series compositions have the following components:

Cu in the range of 75.8 - 76.2;

Si in the range of 2.8 - 3.0;

Lead contents of A-1 has negligible, if any, lead content;
A-2 has 0.1 Pb;
A-3 has 0.4 Pb;
A-4 has 0.5 Pb;
A-5 has 0.7 Pb;
A-6 has 1.0 Pb;
A-7 has 1.3 Pb; and

the Remainder Zn, with negligible, if any, amounts of Sn, Fe, Mn, Ni, Al.

As can be seen from the above, the compositions in system A vary most significantly in their lead content. Further, as the lead content increases, by necessity the content of the other elements must decrease. Accordingly, Applicants submit that the compositions of system A are as close as possible to one another except for their lead content.

Similarly, as also shown in Exhibit A, examples B-1 and B-2 represent compositions in the present invention, whereas examples B3 to B5 represent comparison compositions. All the B series compositions have the following components:

Cu in the range of 59.6 - 60.1;

Negligible, if any, Si;

Lead contents of B-1 has 0.2 Pb;
B-2 has 0.4 Pb;
B-3 has 0.5 Pb;
B-4 has 0.8 Pb;
B-5 has 1.0 Pb;

Cu in the range of	59.6	-	60.1;
Sn in the amount of	0.2;		
Fe in the amount of	0.7;		
Mn in the range of	2.2	-	2.4;
Ni in the range of	0.1	-	0.2;
Al in the range of	0.6	-	0.7; and

the remainder Zn.

As can be seen from the above, the compositions in system B vary most significantly in their lead content. And again, as the lead content increases, by necessity the content of the other elements must decrease. Accordingly, Applicants submit that the compositions of system B are as close as possible to one another except for their lead content.

Further, as noted in the previous response, each of the listed alloys were subjected to a machining test under the following (same) conditions for comparison of surface coarseness, as shown in Exhibit B.

Diameter of test piece:	40 mm
Cutting Speed:	100 m/min
Feed Speed:	0.11 mm/rev

Thus, as can be seen from the above, the Exhibits A and B do, indeed, show a comparison done under as identical conditions as possible, except for the lead content, which is one novel feature of the invention. Further, Exhibits A & B show that the roughness of the present invention samples is reduced as compared with that of the comparison examples.

"Reducing" an Amount of Lead

The Examiner, citing to Merriam-Webster's Collegiate Dictionary, 10th edition, asserts that "reducing" is not the same as "excluding". When analyzed in a vacuum, Applicants realize that there are differences in these terms. However, when given the context in which "excluding" is used in the specification, it is clear that its meaning is the same as "reducing".

Specifically, the specification sets the stage of the present invention by discussing the background thereof. Initially, for retainers of rolling bearings, there were used high strength

brass materials such as HBsC1 and HBsC2.[1] The specification goes on to note that as the conditions under which the rolling bearings are used have become more severe, the retainer has been made from a free-cutting brass, such as YBsC3, which contains 0.5 - 3.0 % lead.[2] The specification goes on to state the problems with using free-cutting brass, such as YBsC3, and states as its object overcoming these problems.[3] Thus, YBsC3 is the starting point of the present invention. Accordingly, when the specification states that lead is "excluded" from YBsC3, it means that YBsC3 was taken as a starting point, wherein the existing lead content was already in the range of 0.5 to 3.0%. Thus, "excluding" lead from YBsC3 so as to arrive at the claimed lead content of 0.4% or lower, really means that the amount of lead in the starting YBsC3 was reduced; i.e., the claimed range of lead is lower than that in the starting material YBsC3 and, therefore, it has been reduced. If lead was added to a composition to make the material of the present invention, the material would not be YBsC3, as its lead content would never have been in the range of 0.5 to 3.0%, which is required for YBsC3.

In light of the above, Applicants submit that in the context of the present invention as given by the specification, "excluding" lead from YBsC3, means "reducing" the lead content from that in the starting material of YBsC3. Accordingly, the specification does provide support for the subject matter as now set forth in claims 18 and 19.

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[1] Specification at page 1, 2nd full paragraph.

[2] Specification at page 1, last paragraph, and page 2, 1st paragraph. See also, Excerpt from JIS handbook as filed March 10, 2003.

[3] Specification at page 2, line 6 - page 4, line 20.

Conclusion

Consideration of these remarks in connection with the March 10, 2003 Amendment, as well as an early and favorable action on the merits, are now hereby requested.

Respectfully submitted,

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Date: May 12, 2003

JIS H 5101 Brass Casting

1. Applicable Scope This technical standard define brass casting for general use (hereinafter referred to as casting).

2. Class and Symbol Class and symbol of casting is classified as shown in Table 1 according to its chemical constituent.

Table1. Class and symbol

Class	Symbol	Reference
		Characteristic and examples of use application
Category 1	YBsC1	Easy to braze. Flanges, electric component, decoration goods, etc.
Category 2	YBsC2	Easy to cast comparatively. Electric component, measuring gauge component, general machine component, etc.
Category 3	YBsC3	Better mechanical performance than category 2 has. Plumbing fitting, electric component, building fitting, general machine component, etc.

3. Quality

3.1. Appearance Casting should have good casting surface and shouldn't have defects such as crack and blow hole.

3.2. Chemical Constituent Chemical constituent of casting is as shown in Table 2.

Table 2. Chemical constituent Unit:%

Class	Cu	Zn	Pb	Sn	Al	Fe	Ni
Category 1	83.0~88.0	11.0~17.0	Less than 0.5	(Less than 0.1)	(Less than 0.2)	(Less than 0.2)	(Less than 0.2)
Category 2	65.0~70.0	24.0~34.0	0.5~3.0	(Less than 1.0)	(Less than 0.5)	(Less than 0.8)	(Less than 1.0)
Category 3	58.0~64.0	30.0~41.0	0.5~3.0	(Less than 1.0)	(Less than 0.5)	(Less than 0.8)	(Less than 1.0)

Remarks: Regarding constituents whose numeric value is shown in parentheses, only constituents required by orderer to analyze are done that.

3.3 Mechanical Performance Mechanical performance of casting (Breaking strength and elongation) is as shown in Table 3.

Table 3. Mechanical performance
(Applicable as from January 4, 1991)

Class	Tensile test	
	Breaking strength N/mm^2	Elongation %
Category 1	More than 145	More than 25
Category 2	More than 195	More than 20
Category 3	More than 245	More than 20

4. Shape, Size and Mass Shape, size and mass of casting are based on its model or drawing. Tolerances of shape, size and mass are based on an agreement between an interested party passing casting and the other one receiving it.

5. Test

5.1 Discriminating Test Discriminating test of chemical constituent is based on one of following standards.

JIS H 1051 (Copper determination in copper and copper alloy)
JIS H 1052 (Tin determination in copper and copper alloy)
JIS H 1053 (Lead determination in copper and copper alloy)
JIS H 1054 (Iron determination in copper and copper alloy)
JIS H 1056 (Nickel determination in copper and copper alloy)
JIS H 1057 (Aluminum determination in copper and copper alloy)
JIS H 1292 (Fluorescent X-ray analysis method in copper and copper alloy)

Incidentally, fluorescence spectrometry, atomic absorption spectrometry, fluorescent X-ray analysis method are based on an agreement between an interested party passing casting and the other one receiving it.

6.

6.1 Tensile Test Tensile test is based on JIS Z 2241(Tensile test method for metals). In this case, test piece is.......